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EXAMINER
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DEJONG, ERIC S

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* FRANK E. KUHLMANN, HELOISE LOGAN,  
STEVEN M. FISCHER, and XIANGDONG DON LI<sup>1</sup>

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Appeal 2016-005805  
Application 12/938,953  
Technology Center 1600

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Before DONALD E. ADAMS, RICHARD J. SMITH, and  
JOHN E. SCHNEIDER, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a method of curating a mass spectral library. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm the rejection under 35 U.S.C. § 101.

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<sup>1</sup> According to Appellants, the real party in interest is Agilent Technologies, Inc. (Appeal Br. 3.)

## STATEMENT OF THE CASE

### *Claims on Appeal*

Claims 1–9 and 20–22 are on appeal.<sup>2</sup> (Claims Appendix, Appeal Br. 13–15.) Claim 1 is illustrative and reads as follows:

1. A method of curating a mass spectral library, comprising
  - (a) obtaining an experimentally derived mass spectrum of a compound of interest;
  - (b) identifying a peak in the mass spectrum that represents an experimental m/z value for an ion fragment of the compound of interest;
  - (c) after said peak has been identified, removing from the mass spectrum all peaks that do not correspond to the compound of interest to produce an uncurated mass spectrum for the compound of interest; and
  - (d) replacing the experimental m/z value for the peak identified in step (b) in said uncurated mass spectrum with a theoretically calculated m/z value for the ion fragment, thereby generating a curated mass spectrum for said compound of interest.

### *Examiner's Rejections*

1. Claims 1–9 and 20–22 stand rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter (abstract idea). (Ans. 2–4.)
2. Claims 1–3 stand rejected under 35 U.S.C. § 102(b) as anticipated by Olsen.<sup>3</sup> (*Id.* at 4–6.)
3. Claims 1–5 and 20–22 stand rejected under 35 U.S.C. § 103(a) as

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<sup>2</sup> Claims 10–17 are withdrawn as drawn to non-elected subject matter. (Final Act. 2, dated April 24, 2015). The abbreviation m/z used in the claims refers to mass-to-charge. (Spec. ¶ 9.)

<sup>3</sup> Olsen et al., *Parts per Million Mass Accuracy on an Orbitrap Mass Spectrometer via Lock Mass Injection into a C-trap*, *Molecular & Cellular Proteomics* 4.12, 2010–21 (2005) (“Olsen”).

unpatentable over Olsen and Darland.<sup>4</sup> (*Id.* at 6–8.)

4. Claims 1–3, 6–9, and 20–22 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Olsen and Hill.<sup>5</sup> (*Id.* at 8–9.)

#### FINDINGS OF FACT

We adopt as our own the Examiner’s findings regarding the rejection under 35 U.S.C. § 101. The following findings are included for emphasis and reference purposes.

FF 1. The Specification states “[w]here the presented methods refer to manipulations that are commonly associated with mental operations, such as, for example, curating, obtaining, calculating, correcting, or conducting, no such capability of a human operator is necessary. In other words, any and all of the operations described herein may be machine operations.” (Spec. ¶ 31.)

FF 2. The Examiner finds that the claims “recit[e] a judicial exception in the form of an abstract idea comprising a series of abstract data manipulation and computational analysis steps. . . . All steps of the recited process involve manipulations of the mass spectral data.” (Ans. 2–3.)

FF 3. The Examiner finds that “the instant claims do not require any physical step or cause any physical change to occur. Rather, the claimed method acts on data, per se.” (*Id.* at 3.)

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<sup>4</sup> Darland et al., *Superior Molecular Formula Generation from Accurate-Mass Data*, Agilent Technologies Technical Overview, 1–12 (2008) (“Darland”).

<sup>5</sup> Hill et al., *Automated assignment of high-resolution collisionally activated dissociation mass spectra using a systematic bond disconnection approach*, *Rapid Commun. Mass Spectrum.* 19, 3111–18 (2005) (“Hill”).

FF 4. The Examiner finds that

Performing mass spectroscopy on [a] sample is not new or improved; rather it encompasses routine and conventional procedures that are old and well known in this field. Further, identifying peaks in a mass spectrum and associating them to components of a compound of interest is also not new, but again embraces what is routine and conventional in this field of mass spectral analysis of observed features of mass spectra.

(Ans. 3–4.)

FF 5. The Examiner finds that “the recited claims do not present anything significantly more than [the] abstract idea . . . The addition[al] elements recited in the claims do not represent any significant improvement, rather [they] encompass[] only the routine and conventional procedures already known to the art.” (Ans. 4.)

## DISCUSSION

### *Rejection No. 1*

#### *Issue*

Whether a preponderance of the evidence of record supports the Examiner’s rejection of claim 1 under 35 U.S.C. § 101.

#### *Analysis*

The Examiner finds that claim 1 recites an abstract idea comprising data manipulation and computational analysis steps without presenting anything significantly more than the abstract idea. (FF 2–5.) Appellants argue that the claimed method “results in the transformation of experimentally derived mass spectrum data into a practically applied curated mass spectrum for a particular purpose.” (Appeal Br. 7; *see also* Reply Br. 2–4.)

In analyzing patent eligibility questions under 35 U.S.C. § 101, the Supreme Court instructs us to “first determine whether the claims at issue are directed to a patent-ineligible concept.” *Alice Corp. Pty Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2355 (2014). If this threshold is met, we move to a second step of the inquiry and “consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Id.* (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1297 (2012)).

*Step 1*

We agree with the Examiner that claim 1 is directed to a patent-ineligible concept; namely, an abstract idea. Abstract ideas include data analysis and algorithms. *See, e.g., Alice* 134 S. Ct. at 2355; *Bilski v. Kappos*, 561 U.S. 593, 611 (2010); *Parker v. Flook*, 437 U.S. 584, 594–95 (1978); and *Gottschalk v. Benson*, 409 U.S. 63, 71–72 (1972). Our reviewing court has also made clear that abstract ideas include collecting information and analyzing that information “by steps people go through in their minds, or by mathematical algorithms.” *FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1093–94 (Fed. Cir. 2016) (internal citation omitted). Moreover, taking some action in response to the collected and analyzed information, without more, is also “abstract as an ancillary part of such collection and analysis.” *Id.* (claims directed to collecting and analyzing information to detect misuse of protected health information and “notifying a user when misuse is detected.”) Put concisely, “[w]ithout additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible.”

*Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1351 (Fed. Cir. 2014).<sup>6</sup>

Here, claim 1 is directed to collecting and analyzing mass spectrum data (“obtaining” and “identifying” steps (a) and (b)), and taking action in response to the collection and analysis (“removing” and “replacing” steps (c) and (d)). *See FairWarning*, 839 F.3d at 1093–94. Moreover, claim 1 is directed to “manipulations that are commonly associated with mental operations.” (FF 1.)

*Step 2*

In considering the second step of the *Alice* inquiry, we agree with the Examiner that nothing in claim 1 adds “significantly more than [the] abstract idea.” (FF 5.) While Appellants argue that claim 1 is directed to the transformation of mass spectrum data under the machine-or-transformation test (Appeal Br. 5–6), our reviewing court has held that “[t]he mere manipulation or reorganization of data . . . does not satisfy the transformation prong” of the machine-or-transformation test. *Cybersource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed. Cir. 2011). Moreover, “[t]he claim limitations, analyzed alone and in combination, fail to add ‘something more’ to ‘transform’ the claimed abstract idea of collecting and analyzing information . . . into ‘a patent-eligible application.’” *FairWarning*, 839 F.3d at 1095 (quoting *Alice*, 134 S.Ct. at 2354, 2357).

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<sup>6</sup> *See also Intellectual Ventures v. Capital One*, 2017 WL 900031,\*5 (Fed. Cir. March 7, 2017), discussing cases in which claims reciting data manipulation steps were held to be patent ineligible as abstract ideas.

*Conclusion*

A preponderance of the evidence of record supports the Examiner's rejection of claim 1 under 35 U.S.C. § 101. Claims 2–9 and 20–22 were not argued separately and fall with claim 1.

*Rejection No. 2*

*Issue*

Whether a preponderance of the evidence of record supports the Examiner's finding of anticipation under 35 U.S.C. § 102(b).

*Analysis*

Appellants contest the anticipation rejection by arguing that Olsen “fails to describe a step of removing from the mass spectrum all peaks that do not correspond to the compound of interest to produce an uncurated mass spectrum for the compound of interest.” (Appeal Br. 8.) In particular, Appellants take issue with the Examiner's position that this step is disclosed in Olsen because “the BSA peptide of interest was isolated for further fragmentation as per Fig. 2, and therefore any ions, and therefore peaks, not corresponding to this compound were discarded.” (*Id.*, citing Final Act. 5.) According to Appellants, this isolation process “does not result in removal from the spectrum of all peaks that do not correspond to the compound of interest,” such as peaks resulting from electronic noise. (Appeal Br. 9.) Appellants also argue that the term “mass spectrum” refers to data and not a sample that will be analyzed by mass spectrometry. (*Id.* at 10.)

We are persuaded by Appellants' arguments. Anticipation requires that a prior art reference disclose every limitation of the claimed invention, either explicitly or inherently. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed.



Cir. 1997). In this case, the Examiner has not persuasively established that the claimed “removing” step at issue is disclosed by Olsen.

*Conclusion*

A preponderance of the evidence of record fails to support the Examiner’s finding that claims 1–3 are anticipated under 35 U.S.C. § 102(b).

*Rejection Nos. 3 and 4*

*Issue*

Whether a preponderance of the evidence of record supports the Examiner’s conclusions of obviousness under 35 U.S.C. § 103(a).

*Analysis*

Appellants contest the obviousness rejections with the same argument set forth above; namely, the failure of Olsen to describe the step of “removing from the mass spectrum all peaks that do not correspond to the compound of interest to produce an uncurated mass spectrum for the compound of interest.” (Appeal Br. 11–12.)

We are again persuaded by Appellants’ arguments. A prima facie case for obviousness “requires a suggestion of all limitations in a claim.” *CFMT, Inc. v. Yieldup Int’l Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003). In this case, the Examiner has not persuasively established that the claimed “removing” step at issue is suggested by Olsen, and that deficiency is not cured by Darland or Hill.

*Conclusions*

A preponderance of the evidence of record fails to support the Examiner’s rejections under 35 U.S.C. § 103(a) of claims 1–5 and 20–22 pursuant to Rejection No. 3, and claims 1–3, 6–9, and 20–22 pursuant to Rejection No. 4.

SUMMARY

We affirm the rejection of claims 1–9 and 20–22 under 35 U.S.C. § 101.

We reverse the rejection of claims 1–3 under 35 U.S.C. § 102(b).

We reverse the rejections under 35 U.S.C. § 103(a) of claims 1–5 and 20–22 (Rejection No. 3) and claims 1–3, 6–9, and 20–22 (Rejection No. 4).

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED